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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/465,705 | 12/17/1999 | JAMES AWEYA | 81395-131 | 9205 |

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| EXAMINER |
|---|
| ODLAND, DAVID E |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2662 | |

DATE MAILED: 09/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/465,705 | AWEYA ET AL. | |
| | Examiner | Art Unit | |
| | David Odland | 2662 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13 and 15-29* is/are rejected.

7)☒ Claim(s) *14 and 30* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-8 and 15-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruutu et al. (USPN 6,219,713), hereafter referred to as Ruutu, in view of Kolarov et al. (USPN 5,737,313), hereafter referred to as Kolarov.

Referring to claims 1,16,17,18 and 19, Ruutu discloses an apparatus for adjusting the volume of data communicated between a transmitter and a receiver through a queue on a network in a time interval (a method for adjusting a sliding window (see abstract and figure 2)), the apparatus comprising:

a) a detector for detecting an acknowledgement signal produced by the receiver in response to receipt of a data packet at the receiver (a Feedback Information Center (FIC) receives an acknowledgement (ACK) packet form the receiver (see abstract and column 4 lines 53-67));

b) a volume value generator for computing a network element volume value in response to a receiver volume value specified by said acknowledgement signal (the FIC modifies an original advertised window size based in part on the value of the original advertised window size that it receives in the ACK from the receiver, thus generating a new ACK, which it sends to the source transmitter (see figures 4 and 5 and column 5 lines 36-67)); and

c) a signal modifier for producing a modified acknowledgement signal including a desired volume value for communication to the transmitter, in response to said network element volume value and a receiver volume value identified in said acknowledgement signal (the FIC modifies an original advertised window size based in part on the value of the original advertised window size that it receives in the ACK from the receiver, thus generating a new ACK, which it sends to the source transmitter (see figures 4 and 5 and column 5 lines 36-67)).

Ruutu does not disclose that the volume value is also generated based on a difference between a target departure volume and an estimate of arrival volume of data at a queue through which data passes from the transmitter to the receiver. However, Kolarov, discloses a system that detects congestion by monitoring the growth of a queue based on the difference between the rate cells are arriving in the queue (estimated arrival volume) and the rate the cells are being served from the queue (target departure volume). It would have been obvious to one skilled in the art to implement the use the congestion monitoring technique of Kolarov in determining the advertised window value in Ruutu, because such a technique would help detect and prevent congestion, thus improving the reliability of Ruutu.

Note, regarding claims 16 and 17, Ruutu performs the volume adjustment operation through the use of a processor (see figure 4). Ergo, the processor inherently uses instructions (codes/code segments) that it must receive from registers or memory or some storage device(s) (computer readable medium), in the form of signals (signals embodied in a carrier wave).

Referring to claims 2 and 20, Ruutu discloses the system discussed above. Furthermore, Ruutu discloses detecting an acknowledgement signal produced by the receiver in response to

receipt of a data packet at the receiver (the FIC receives ACKs from the receiver (see column 4 lines 53-67).

Referring to claims 3 and 21, Ruutu discloses the system discussed above. Furthermore, Ruutu discloses communicating said desired volume value to the transmitter comprises:

a) generating a network element volume value (the FIC generates a modified ACK (see abstract and column 5 lines 35-67)); and

b) communicating at least one of said receiver volume value and said network element volume value to the transmitter (the FIC sends the modified ACK to the source transmitter (see abstract and column 5 and figure 4)).

Referring to claims 4 and 22, Ruutu discloses the system discussed above. Furthermore, Ruutu discloses extracting said receiver volume value from said acknowledgement signal (the source uses the new ACK to adjust its transmission window (see abstract and column 5 and figure 4)).

Referring to claim 5, Ruutu discloses the system discussed above. Furthermore, Ruutu discloses producing said desired volume value further comprises extracting a plurality of receiver volume values from a plurality of acknowledgement signals (the ACK generation and transmission by the FIC to the source transmitter is an on going repetitive process and thus a plurality of ACKs are received and a plurality of window sizes are extracted (see abstract and column 5 and figure 4)).

Referring to claim 6, Ruutu discloses the system discussed above. Ruutu does not disclose that producing said desired volume value comprises setting as said receiver volume value a maximum receiver volume value of said plurality of receiver volume values. However, it

would have been obvious to one skilled in the art at the time of the invention to set the advertising window size to the maximum of a plurality of window sizes because doing so would allow for the maximum amount of throughput for the network, thus allowing the system to operate faster.

Referring to claim 7, Ruutu discloses the system discussed above. Furthermore, Ruutu discloses communicating said desired volume value to the transmitter comprises communicating the lesser of said receiver volume value and said network element volume value to the transmitter (if the original window size is smaller it is transmitted to the source otherwise the modified window size is transmitted (see column 5 lines 49-67)).

Referring to claim 8, Ruutu discloses the system discussed above. Furthermore, Ruutu discloses producing a modified acknowledgement packet including said lesser of said receiver volume value and said network element volume value and communicating said modified acknowledgement packet to said transmitter (if the original window size is smaller it is transmitted to the source otherwise the modified window size is transmitted (see column 5 lines 49-67)).

Referring to claim 15, Ruutu discloses the system discussed above. Furthermore, Ruutu discloses that generating said network element volume value comprises bounding said network element volume value between a maximum value and a minimum value (the advertised window value is inherently bounded by the system (i.e. the minimum size of the sliding window can not be less than 0 and the maximum value can not be greater than the size of the transmitters buffer since all the packets in the sliding window are moved into the buffer of the transmitter (see figure 2-4 and abstract)).

Referring to claim 23, Ruutu discloses the system discussed above. Furthermore, Ruutu discloses producing said desired volume value further comprises extracting a plurality of receiver volume values from a plurality of acknowledgement signals (the ACK generation and transmission by the FIC to the source transmitter is an on going repetitive process and thus a plurality of ACKs are received and a plurality of window sizes are extracted (see abstract and column 5 and figure 4)). Ruutu does not disclose that producing said desired volume value comprises setting as said receiver volume value a maximum receiver volume value of said plurality of receiver volume values. However, it would have been obvious to one skilled in the art at the time of the invention to set the advertising window size to the maximum of a plurality of window sizes because doing so would allow for the maximum amount of throughput for the network, thus allowing the system to operate faster.

Referring to claim 24, Ruutu discloses the system discussed above. Furthermore, Ruutu discloses communicating said desired volume value to the transmitter comprises communicating the lesser of said receiver volume value and said network element volume value to the transmitter (if the original window size is smaller it is transmitted to the source otherwise the modified window size is transmitted (see column 5 lines 49-67)).

3. Claims 9,10, 25 and 26 rejected under 35 U.S.C. 103(a) as being unpatentable over Ruutu in view of Kolarov and further in view of the article "Random Early Detection Gateways for Congestion Avoidance" by Floyd et al., hereafter referred to as Floyd.

Referring to claims 9 and 25, Ruutu discloses the system discussed above. Ruutu does not disclose that generating said network element volume comprises time filtering successive arrival

volume values to produce a filtered arrival volume value. However, Floyd discloses a system wherein the average length (fullness) of a queue is determined by inspecting the number of packets arriving packets (arrival volume values) of the buffer over a time period (time filtered) (see sections 6 and 11). It would have been obvious to one skilled in the art at the time of the invention to implement this method of Floyd in the system of Ruutu because doing so would allow the FIC of the Ruutu system to detect the fullness levels of its buffers and thus a congestion condition when its queue is over-filled. This information can be used to prevent ot correct the congestion, thereby increasing system reliability.

Referring to claims 10 and 26, Ruutu discloses the system discussed above. Ruutu does not disclose that the time filtering comprises producing a weighted sum of present and past arrival volume values. However, Floyd discloses a weighting factor, wq, is used in the calculation of summing the number of arrived packets to the queue over a time period (fullness of the queue) (see sections 6 and 11). It would have been obvious to one skilled in the art at the time of the invention to use such a calculation in the system of Ruutu because doing so would allow the FIC of the Ruutu system to determine a congestion condition when its queue is over-filled, thereby preventing congestion and increasing system reliability.

4. Claims 11 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruutu in view of Kolarov and further in view of Fan et al. (USPN 6,324,165), hereafter referred to as Fan.

Referring to claims 11 and 27, Ruutu discloses the system discussed above. Ruutu does not disclose that the volume value generator comprises a departure volume value generator for generating an estimated target data packet departure volume value in response to an actual service volume, value of the queue and a target utilization factor of the queue. However, Fan discloses a system where the actual output rate (E) of a queue (actual service volume) is adjusted to a new value (estimated target data packet departure volume) according to a wanted utilization ($U_2$) of the queue (a target utilization factor (see column 20 line 46 through column 21 line 45)). It would have been obvious to one skilled in the art at the time of the invention to implement the target departure volume mechanism of Fan in the system of Ruutu because doing so would help maintain the proper utilization of the queue thereby preventing under or overflow which will avoid packet loss and delays, thereby making the system more reliable.

5. Claims 12, 13, 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruutu in view of Kolarov and further in view of Aweya et al. (USPN 6,549,517), hereafter referred to as Aweya.

Referring to claims 12,13, 28 and 29, Ruutu discloses the system discussed above. Ruutu does not disclose that the volume generator comprises a queue control mechanism that computes a scaling factor to adjust the queue size according to a threshold. However, Aweya discloses a queue size control mechanism for controlling the size of the queue (a queue size control mechanism (see column 16 lines 3-25 and figure 6)), which further comprises a processor circuit for computing a scaling factor to diminish said network element volume value when the number of packets in the queue exceeds a threshold value (the queue size is scaled down when the

number of packets in the queue exceeds a threshold (see column 16 lines 3-25 and figure 6)). It would have been obvious to one skilled in the art at the time of the invention to implement the queue control mechanism of Aweya in the system of Ruutu because doing so would help prevent packet loss and reduce delays, thereby making the system more reliable.

### *Allowable Subject Matter*

6. Claims 14 and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form *including all of the limitations of the base claim and any intervening claims*.

### *Conclusion*

7. The following prior art, which is made of record and not relied upon, is considered pertinent to applicant's disclosure:

a. U.S. Patent Number 5748901 to Afek et al.

b. U.S. Patent Number 5546389 to Wippenbeck et al.

c. U.S. Patent Number 5805585 to Javitt et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Odland, who can be reached at (703) 305-3231 on Monday – Friday during the hours of 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou, can be reached at (703) 305-4744. The fax number for the organization where this application or proceeding is assigned is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist, who can be reached at (703) 305-4750.

deo

September 5, 2003

JOHN PEZZLO
PRIMARY EXAMINER